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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* MATTHEW PRINCE,  
SHAESTAGIR CHOWDHURY,  
BRIAN WESELAK, and JIM XU

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Appeal No. 2008-0783  
Application No. 10/762,849  
Technology Center 3700

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Decided: March 24, 2008

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Before HUBERT C. LORIN, JENNIFER D. BAHR, and  
STEVEN D.A. McCARTHY, *Administrative Patent Judges*.

LORIN, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Prince, et al. (Appellants) seek our review under 35 U.S.C. § 134 (2002) of the final rejection of claims 1-5 and 11-15.<sup>1</sup> We have jurisdiction under 35 U.S.C. § 6(b) (2002).

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<sup>1</sup> Claims 6-10 and 16-20 have been cancelled. App. Br. 5.

## SUMMARY OF DECISION

We AFFIRM.<sup>2</sup>

### THE INVENTION

The invention relates to processes for manufacturing semiconductor integrated circuits. Specification 1:2-3. Specifically the invention pertains to the chemical mechanical polishing of a titanium barrier layer. Generally, the invention “involves the use of slurries including silica.” Specification 1: 13-14. “The inventors of the present invention noticed that the number of defects that were detected after chemical mechanical polishing of tantalum barrier layers were variable. The inventors were able to discover that a determinant of the number of defects was the age of the silica slurry used in polishing” Specification 3:1-6. “It was determined that silica slurries with ages of greater than fifty days resulted in less defects when used to chemical mechanical polish tantalum containing barrier layers.” Specification 3:10-13.

Claim 1 is illustrative of the claimed invention.

1. A method comprising:  
aging an unthickened silica slurry for at least fifty days from its manufacture date;  
and  
using the aged, unthickened slurry to reduce defects when chemical mechanical polishing a tantalum containing layer.

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<sup>2</sup> Our decision will make reference to the Appellants’ Appeal Brief (“App. Br.,” filed Jan. 22, 2007), the Examiner’s Answer (“Answer,” mailed May 3, 2007), and the Reply Brief (“Reply Br.,” filed Jun. 8, 2007).

### THE REJECTIONS

The Examiner relies upon the following as evidence of unpatentability:

Tredinnick                      US 3,715,842                      Feb. 13, 1973  
Appellants' Admitted Prior Art set forth on page 1 of the Specification.

The claims are rejected as follows:

- Claims 1-5 and 11-15 stand rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the written description requirement;
- Claims 1-5 and 11-15 stand rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Appellants regard as the invention;
- Claims 11 and 12 stand rejected under 35 U.S.C. §102(b) as anticipated by Tredinnick et al. or, in the alternative, under 35 U.S.C. §103(a) as obvious over Tredinnick and Appellants' Admitted Prior Art; and,
- Claims 1-5 and 13-15 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Tredinnick and Appellants' Admitted Prior Art.

### ISSUES

The first issue is whether the Appellants have shown that the Examiner erred in rejecting claims 1-5 and 11-15 under 35 U.S.C. §112, first paragraph, as failing to comply with the written description requirement.

The second issue is whether the Appellants have shown that the Examiner erred in rejecting claims 1-5 and 11-15 under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject

matter which Appellants regard as the invention.

The third issue is whether the Appellants have shown that the Examiner erred in rejecting claims 11 and 12 under 35 U.S.C. §102(b) as being anticipated by Tredinnick.

The fourth issue is whether the Appellants have shown that the Examiner erred in rejecting claims 1-5 and 11-15 under 35 U.S.C. §103(a) as unpatentable over Tredinnick and Appellants' Admitted Prior Art.

All these issues turn on the claim term “unthickened.”

## ANALYSIS

*The rejection of claims 1-5 and 11-15 under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement.*

### A. Findings of Fact

We find that the following enumerated findings are supported by at least a preponderance of the evidence. *Ethicon, Inc. v. Quigg*, 849 F.2d 1422, 1427 (Fed. Cir. 1988) (explaining the general evidentiary standard for proceedings before the Office).

1. The term “unthickened” was inserted in claims 1 and 11 by Amendment filed on Feb. 16, 2006. The Application was filed on Jan. 22, 2004.
2. The term “unthickened” is not mentioned in the originally-filed Specification.

## B. Principles of Law

“When the scope of a claim has been changed by amendment in such a way as to justify an assertion that it is directed to a different invention than was the original claim, it is proper to inquire whether the newly claimed subject matter was described in the patent application when filed as the invention of the applicant. That is the essence of the so-called ‘description requirement’ of §112, first paragraph ....” *In re Wright*, 866 F.2d 422, 424 (Fed. Cir. 1989).

“When the applicant adds a claim or otherwise amends his specification after the original filing date ... the new claims or other added material must find support in the original specification.” *TurboCare Div. Of Demag Delaval Turbomachinery Corp. v. General Elec. Co.*, 264 F.3d 1111, 1118 (Fed. Cir. 2001).

To satisfy the description requirement, one must show that one of ordinary skill in the art would recognize that the Appellant was “in possession” of the invention now claimed as of the filing date of the application.

One shows that one is “in possession” of *the invention* by describing *the invention*, with all its claimed limitations, ... . *Id.* (“[T]he applicant must also convey to those skilled in the art that, as of the filing date sought, he or she was in possession of *the invention*. The invention is, for purposes of the ‘written description’ inquiry, *whatever is now claimed*.”) (emphasis in original). One does that by such descriptive means as words, structures, figures, diagrams, formulas, etc., that fully set forth the claimed invention. Although the exact terms need not be used *in haec verba*, see *Eiselstein v. Frank*, 52 F.3d 1035, 1038 (Fed. Cir. 1995) (“ [T]he prior application need not describe the claimed subject matter in exactly the same terms as used in the claims.. . .”), the specification must contain an equivalent description of the claimed subject matter.

*Lockwood v. American Airlines, Inc.*, 107 F.3d 1565, 1572 (Fed. Cir. 1997) (emphasis original).

Compliance with the written description requirement is a question of fact. *Ralston Purina Co. v. Far-Mar-Co, Inc.*, 772 F.2d 1570, 1575 (Fed. Cir. 1985).

### C. Discussion

The Appellants argued claims 1-5 and 11-15 as a group. App. Br. 10. The Board selects representative claim 1 (see *supra*) to decide the appeal and claims 2-5 and 11-15 will stand or fall with claim 1. 37 C.F.R. § 41.37(c)(1)(vii) (2007).

The Examiner argued that there is no written descriptive support for the claimed “unthickened” silica slurry in the original Specification. Answer 3. The Appellants argued that “unthickened” silica slurries were well known in the art. App. Br. 10. The Appellants cited Tredinnick (which the Examiner applied as prior art, see *infra*) which, according to the Appellants, “establishes that it improved the existing slurries by thickening them. Thus, the existing slurries were necessarily unthickened.” App. Br. 10. Because, according to the Appellants, “unthickened” slurries were well known, it was not necessary for the Appellants to describe them in the Specification (citing *Loom Company v. Higgins*, 105 U.S. (15 Otto) 580 (1881), for the proposition that what is well known is presumed to be present in the Specification).

The Appellants’ argument does not persuade us as to error in the Examiner’s rejection.

The question is whether the original Specification would reasonably convey to one of ordinary skill in the art that the Appellants had possession of the claimed

use of an unthickened slurry at the time the application was filed. The original Specification describes the slurries generically; that is, the Specification attributes no particular fluid consistency to the slurry. That the prior art may have suggested to one of ordinary skill in the art the conventionality of “unthickened” slurries at the time the application was filed gives us no insight into whether the Appellants had *possession* of the claimed use of an unthickened slurry at the time the application was filed. In effect, the Appellants would have us determine that it would have been obvious to employ an “unthickened” slurry given the Specification’s disclosure of using a slurry in light of the conventionality of “unthickened” slurries. However, “[t]he question is not whether a claimed invention is an obvious variant of that which is disclosed in the specification. Rather, a prior application itself must describe an invention, and do so in sufficient detail that one skilled in the art can clearly conclude that the inventor invented the claimed invention as of the filing date sought.” *Lockwood v. American Airlines, Inc.*, 107 F.3d at 1572. In our view, one skilled in the art can not clearly conclude from the generic description of slurries disclosed in the original Specification that the Appellants invented the claimed method of using “unthickened” slurries.

*The rejection of claims 1-5 and 11-15 under 35 U.S.C. 112, second paragraph.*

#### A. Principles of Law

The test for compliance with the second paragraph of § 112 is whether the claims set out and circumscribe a particular area with a reasonable degree of precision and particularity when read in light of the application disclosure as they would be interpreted by one of ordinary skill in the art. *In re Moore*, 439 F.2d



1232, 1235 (CCPA 1971). Just because a term is broad, does not mean it is indefinite. *In re Borkowski*, 422 F.2d 904, 908 (1970).

## B. Discussion

The Examiner argued that the term “thickened” renders the claims indefinite because “it is unclear as to what elements should be lacking and/or what elements should be in the slurry to meet the limitation.” Answer 3.

The Examiner is criticizing the term “unthickened” on the grounds that it is too broad; that is, the term “unthickened” leaves the claims open to including or excluding other ingredients. However, just because a term is broad, does not mean the claim is indefinite. The test for compliance is whether the claims set out and circumscribe a particular area with a reasonable degree of precision and particularity when read in light of the application disclosure as they would be interpreted by one of ordinary skill in the art. In that regard, notwithstanding that the term “unthickened” is broad, the Examiner did not explain why one of ordinary skill would not understand the scope of the claims. Since the Examiner did not apply the proper test for determining compliance with the second paragraph of §112, the Examiner has not presented a prima facie case of indefiniteness.

*The rejection of claims 11 and 12 under 35 U.S.C. 102(b) as being anticipated by Tredinnick.*

## A. Findings of Fact

The record supports the following findings of fact (FF) by a preponderance of the evidence.

1. The claims require the use of an unthickened slurry.
2. The Examiner relies on col. 1, ll. 49-55 of Tredinnick in support of the determination that Tredinnick describes using a thickened slurry. Answer 3.
3. Col. 1, ll. 49-55 of Tredinnick reads as follows:

In accordance with the invention, it has been determined that a silica slurry thickened sufficiently with a water-soluble cellulose derivative to inhibit settling of the silica does not even twelve weeks after its preparation cease scratching of silicon and germanium surfaces, and can thus overcome this problem of storage stability.

#### B. Principles of Law

“A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631 (Fed. Cir. 1987), *cert. denied*, 484 U.S. 827 (1987).

#### C. Discussion

The Examiner has the initial burden of establishing a prima facie case of anticipation. The Examiner states that “Tredinnick et al. discloses all of the limitations of claim 11 ... .” Answer 3. In support thereof, the Examiner directs attention to col. 1, ll. 49-55 of Tredinnick. However, that passage does not expressly describe unthickened slurries. FF 3. The Examiner does not otherwise show where in Tredinnick an unthickened slurry is expressly described. The Examiner also fails to explain how Tredinnick would otherwise *necessarily*

describe an “unthickened” slurry. Answer 3. The Examiner discusses various alternatives that could lead to unthickened slurries. Answer 7. However, “[t]he mere fact that a certain thing may result from a given set of circumstances is not sufficient.” *Hansgirg v. Kemmer*, 102 F.2d 212, 214 (CCPA 1939), *quoted in Continental Can Co. USA v. Monsanto Co.*, 948 F.2d 1264, 1269 (Fed. Cir. 1991). Accordingly, the Examiner has not made out a prima facie case of anticipation of the claimed subject matter over Tredinnick.

*The rejection of claims 1-5 and 11-15 under 35 U.S.C. 103(a) as unpatentable over Tredinnick and Appellants’ Admitted Prior Art.*

A. Findings of Fact

We find that the following enumerated findings are supported by at least a preponderance of the evidence. *Ethicon, Inc. v. Quigg*, 849 F.2d 1422, 1427 (Fed. Cir. 1988) (explaining the general evidentiary standard for proceedings before the Office).

*The scope and content of the prior art*

1. Tredinnick discloses that the use of silica slurries to polish silicon or germanium crystals is well known. Col. 1, ll. 29-47.
2. Tredennick discloses thickening silica slurries with a water-soluble cellulose.
3. Tredinnick discloses that thickening silica slurries with a water-soluble cellulose overcomes the problem of storage stability.

In accordance with the invention, it has been determined that a silica

slurry thickened sufficiently with a water-soluble cellulose derivative to inhibit settling of the silica does not even twelve weeks after its preparation cause scratching of silicon and germanium surfaces, and thus overcome this problem of storage stability.

Col. 1, ll. 49-55.

4. Tredennick discloses that polishing silicon or germanium surfaces with a water-soluble cellulose-thickened silica slurry would inhibit the development of a scratching tendency. Col. 1, ll. 49-68.

*Any differences between the claimed subject matter and the prior art*

5. The claimed subject matter differs from that of Tredinnick in that the claimed process employs an unthickened slurry whereas Tredinnick employs a thickened slurry.

*The level of skill in the art*

6. Neither the Examiner nor the Appellants have addressed the level of ordinary skill in the pertinent art of chemical mechanical polishing. We will therefore consider the cited prior art as representative of the level of ordinary skill in the art. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001) (“[T]he absence of specific findings on the level of skill in the art does not give rise to reversible error ‘where the prior art itself reflects an appropriate level and a need for testimony is not shown’”) (quoting *Litton Indus. Prods., Inc. v. Solid State Sys. Corp.*, 755 F.2d 158, 163 (Fed. Cir. 1985)).

*Secondary considerations*

7. There is no evidence on record of secondary considerations of non-obviousness for our consideration.

B. Principles of Law

“Section 103 forbids issuance of a patent when ‘the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.’” *KSR Int’l Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1734 (2007). The question of obviousness is resolved on the basis of underlying factual determinations including (1) the scope and content of the prior art, (2) any differences between the claimed subject matter and the prior art, and (3) the level of skill in the art. *Graham v. John Deere Co.*, 383 U.S. 1, 17-18 (1966). *See also KSR*, 127 S.Ct. at 1734 (“While the sequence of these questions might be reordered in any particular case, the [*Graham*] factors continue to define the inquiry that controls.”) The Court in *Graham* further noted that evidence of secondary considerations “might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented.” 383 U.S. at 18.

C. Discussion

Appellants argued claims 1-5 and 11-15 as a group. App. Br. 11. The Board selects representative claim 1 (see *supra*) to decide the appeal and claims 2-5 and 11-15 will stand or fall with claim 1. 37 C.F.R. § 41.37(c)(1)(vii) (2007).

The question is whether it would have been obvious to one of ordinary skill in the art to modify the Tredinnick process to use an “unthickened” rather than a thickened slurry. The Examiner relied on Tredinnick, col. 1, ll. 49-55, in support of the determination of obviousness. See Answer 3. That passage in Tredinnick describes adding a water-soluble cellulose derivative to a silica slurry to thicken it. FF 3. Accordingly, the water-soluble cellulose derivative has a thickening function. It follows that this thickening function would be excluded from the Tredinnick process if the step of adding the water-soluble cellulose derivative is separated from the remaining steps in the Tredinnick slurry-making process. Separating the step of adding the water-soluble cellulose derivative from the remaining steps in the Tredinnick slurry-making process appears to do no more than yield a predictable result, i.e., an unthickened slurry. Given this predictable result, the claimed method is likely to be obvious. *Cf. KSR*, 127 S.Ct. at 1739: “[t]he combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results.” In that regard, Appellants have provided no evidence that eliminating the water-soluble cellulose derivative from the Tredinnick slurry yields an unexpected result or was beyond the skill of one having ordinary skill in the art. FF 7.

#### CONCLUSION OF LAW

On the record before us, Appellants have failed to show that the Examiner erred in rejecting claims 1-5 and 11-15 under 35 U.S.C. §112, first paragraph, as failing to comply with the written description requirement and under 35 U.S.C. §103(a) as unpatentable over Tredinnick and Appellants’ Admitted Prior Art.

On the record before us, Appellants have shown that the Examiner erred in rejecting claims 1-5 and 11-15 under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Appellants regard as the invention and claims 11 and 12 under 35 U.S.C. §102(b) as being anticipated by Tredinnick.

### DECISION

The rejections of claims 1-5 and 11-15 under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement and under 35 U.S.C. §103(a) as unpatentable over Tredinnick and Appellants' Admitted Prior Art are affirmed; and

the rejections of claims 1-5 and 11-15 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Appellants regard as the invention and claims 11 and 12 under 35 U.S.C. §102(b) as being anticipated by Tredinnick are reversed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a). *See* 37 C.F.R. § 1.136(a)(1)(iv) (2007).

AFFIRMED

vsh

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